Claims

1. Method of determining the adhesion properties of at least two materials to one another, in particular of determining the adhesion properties of at least one coating or film of at least one first material to a substrate of a second material, wherein at least one material, preferably at least one coating or film, is charged with at least one absorbate and at least one critical physical or chemical parameter is determined at which the materials, preferably at least one coating or film, detach from one another, preferably from the substrate, at least partially, in particular substantially completely.

2. Method according to Claim 1, wherein the critical parameter is the amount of absorbate charged.

3. Method according to Claim 1, wherein the critical parameter is the substrate curvature resulting where appropriate from charging with the absorbate.

4. Method according to claim 1, wherein the method steps are implemented at least twice, in particular multiply, and at least one material factor, in particular the thickness of the coating or film, is varied.

5. Method according to claim 1, wherein the critical parameter is used to determine the quantity known as the adhesion energy.

6. Method according to Claim 5, wherein the adhesion energy is determined by determining the slope of a plot of the critical parameter against a function, preferably the reciprocal root, of the material factor, in particular the thickness of the coating or film.

7. Method according to claim 1, wherein the thickness of the coating or film is low relative to the thickness of the substrate.

8. Method according to claim 1, wherein the relationship Es^2/d is between 10^8 Pa·m and 10^{14} Pa·m, preferably between 10^{10} Pa·m and 10^{13} Pa·m, where E is the elasticity modulus of the substrate, s is the thickness of the substrate and d is the thickness of the coating or film.

9. Method according to claim 1, wherein the material factor, in particular the thickness of the coating or film, and/or of the substrate is between 1 nm and 5 mm.

10. Method according to Claim 9, wherein the thickness of the substrate is between 1 μm and 5 mm and the thickness of the coating or film is between 1 nm and 1 μm.

11. Method according to claim 1, wherein the absorbate is at least one liquid.

12. Method according to Claim 11, wherein the absorbate is water.

13. Method according to Claim 11, wherein the absorbate is an organic solvent, in particular dichloromethane or tetrachloromethane.

14. Method according to claim 1, wherein the absorbate is at least one gas.

15. Method according to Claim 14, wherein the absorbate is carbon dioxide.

16. Method according to Claim 14, wherein the absorbate is a gaseous element, in particular hydrogen.

17. Method according to claim 1, wherein charging with the absorbate takes place directly from the liquid phase or gas phase.

18. Method according to claim 1,wherein charging with the gas takes place by electrochemical charging.

19. Method according to claim 1, wherein the first material, in particular the material of the coating or film, is a metal, in particular a noble metal.

20. Method according to claim 1, wherein the first material, in particular the material of the coating or film, is a polymer material, in particular a coating material.

21. Method according to claim 1, wherein the second material, in particular the substrate, is a polymer material.

22. Method according to claim 1, wherein the second material, preferably the substrate, is a metal.

23. Method according to claim 1, wherein in order to determine the critical parameter the detachment process of the two materials, in particular of the coating or film from the substrate, is monitored optically, in particular using a light microscope.

24. Method according to claim 1, wherein in order to determine the critical parameter in the detachment process of the two materials, in particular of the coating or film from the substrate, the surface roughness is monitored, in particular by determination of the surface reflectivity and/or of the surface scattering behaviour.

25. Method according to claim 1, wherein at least one coating/film which absorbs the absorbate is firmly connected to at least one further coating/film which does not absorb the absorbate, or which absorbs it only at a low concentration, and by charging the coating/film which absorbs the absorbate with the absorbate the adhesion properties of the coating/film which does not absorb the absorbate or which absorbs it only at a low concentration to the substrate is determined.

26. Method according to claim 1, wherein for the determination of the adhesion properties, including the substrate, a layer construction of from two to four, preferably two or three, layers is provided.